

REMARKS

With regards to the substance of the Office Action, Applicants respectfully traverse the rejections provided in the Office Action. Contrary to the assertions of the Examiner, U.S. Patent Number 6,519,597 to Cheng et al. ("Cheng") does not disclose the functionality of "generating (28) the schema (22) for the relational database (14) from the metadata" which is "extracted" from the "document" itself.

In Cheng, it is the human user who generates the schema. The document in Cheng does not provide the mechanism for generating the schema, and thus Applicants' claims 1-74 are in condition for allowance.

I. SECTION 102(e) REJECTION OF CLAIMS

A) 102(e) REJECTION OF CLAIMS 1-10, 12-17, 30-47 and 61-66

In the Office Action, the Examiner rejected Claims 1-10, 12-17, 30-47 and 61-66 as being anticipated under 35 U.S.C. 102(e) by Cheng et al., U.S. Patent No. 6,519,597 ("Cheng"). The Examiner incorrectly argues that Cheng discloses the entirety of Claims 1-10, 12-17, 30-47 and 61-66.

With respect to independent claims 1 and 37, Applicants respectfully traverse the rejection. As the Examiner indicates, claim 37 is very similar to claim 1 except that it is directed to a system rather than a method. Applicants' claims are distinguishable from Cheng for several reasons, including but not limited to the user interaction involved in "generating (28) the schema (22) for the relational database (14) from the metadata (34)." The Applicants' claims do not require a human being to map document elements to relational schema.

Central to the process in Cheng is the affirmative intervention of a human being for the purposes of mapping metadata to relational schema to guide storage in the table (Cheng col 8, lines 13-15; col 11, lines 62-63; col 24, line 37; col 25, line 1; col 26, line 4). Cheng requires a

user to manually map the metadata to the table (col. 8, 13-15; col. 11, 62-63). In addition, *all* independent claims of Cheng include the user in the claim preamble. The preamble of independent Claim 1 of Cheng reads “said extender enabling a *user* to create said at least one index in said database system” (emphasis added). The preamble of independent Claim 7 of Cheng reads “said extender enabling a *user* to create an index in said database system” (emphasis added). The preamble of independent Claim 13 of Cheng reads “said extender enabling a *user* to create said at least one index in said database system” (emphasis added).

Applicants’ Background of Invention section clearly documents the limitations associated with mapping XML data into a relational database schema. The disadvantages of technologies such as Cheng are put forth by the Applicants in explaining the benefits of their invention. Paragraph [0020] of the application states “[T]hese methods are *far from automatic*...[and] *require users to manually design* the relational schema for a given DTD and to define the mapping between the DTD and the user-designated schema for the loading of XML documents.” (emphasis added).

In fact, Applicants’ invention was specifically conceived in light of prior art that required a user to manually map metadata to a relational schema. The present invention was conceived to remove a user from the mapping process, eliminating the need for a user skilled in the arts of both XML construction and relational databases and/or having knowledge of the document structure itself. Further, removing the user would increase precision, reliability, and increase the complexity of the XML documents that could be automatically stored in a relational database.

Fig. 1 of the application illustrates an end-to-end system for storing XML documents in a relational database without user interaction. The metadata (34) is extracted (24) from the DTD (18), the schema (22) for the relational database is generated (28) from the metadata (34) and the data is loaded (30) into the table (20) according to the relational schema (22). In contrast, Fig. 4 of Cheng requires guidance by the user in step S7. In Cheng, Fig. 4, the table is not loaded in step S8 until after the relational mapping is provided by the user in step S7. Applicants’

invention *generates the relational schema (22) from the metadata (34)* and loads the table (20) according to the relational schema (22) (Application Fig. 1 and paragraph [0047]).

Cheng requires a user to manually map the metadata to the table (col. 8, 13-15; col. 11, 62-63). In addition, *all* independent claims of Cheng include the user in the claim preamble. The preamble of independent Claim 1 of Cheng reads “said extender enabling a *user* to create said at least one index in said database system” (emphasis added). The preamble of independent Claim 7 of Cheng reads “said extender enabling a *user* to create an index in said database system” (emphasis added). The preamble of independent Claim 13 of Cheng reads “said extender enabling a *user* to create said at least one index in said database system” (emphasis added).

Applicants’ invention excludes the user from the process. User intervention is not required. The application is entitled “System and method for *automatic* loading of an XML document defined...” (emphasis added). Absent from all the claims is a reference to user interaction. Further, the application discloses that a problem solved by the invention is removal of user-mapping of the DTD and the relational schema at paragraph [0020]. The detailed description of Fig. 1A discloses the *automatic* loading of the XML document into a relational database at paragraph [0085].

Described graphically, Fig. 1 illustrates how Applicants’ invention differs from Cheng. Generator (28) replaces the user interaction *described in and required in Cheng* (Cheng col 8, lines 13-15; col 11, lines 62-63; col 24, line 37; col 25, line 1; col 26, line 4). Applicants’ invention automatically generates the relational schema (22) from the metadata (34) extracted from the DTD (18) thereby allowing the schema for loading a relational database to be automatically generated from the document, not by user interaction as *described and required in Cheng* (Cheng col 8, lines 13-15; col 11, lines 62-63; col 24, line 37; col 25, line 1; col 26, line 4).

Thus claims 1 and 37 are distinguishable from the disclosures contained in Cheng on the basis that the invention allows for automatic loading of an XML document into a relational database including the generation of a relational schema *from the document itself*. Cheng is limited and requires a user to map the DTD to the relational schema for storage of an XML document into a relational database, and thus Claims 1 and 37 in the application are not anticipated by the disclosures of Cheng and are allowable.

Applicants respectfully submit that since claims 2-10 and 12-17 are proper dependent claims from claim 1, and that claims 38-47 and 61-66 are proper dependent claims from claim 37, the claims 1-10, 12-17, 30-47 and 61-66 are all allowable.

B) 102(e) REJECTION OF CLAIMS 67-74

In the Office Action, the Examiner rejected Claims 67-74 as being anticipated under 35 U.S.C. 102(e) by Cheng et al., U.S. Patent No. 6,519,597 ("Cheng"). The Examiner argues that Cheng discloses the entirety of Claims 67-74.

With respect to independent claims 67, Applicants respectfully traverse the rejection. As an initial matter, Cheng does not disclose "a system (10) for generating (28) schema (22)" as set forth in the preamble of claim 67. Thus, Cheng does not disclose "a system (10) for generating (28) schema (22) for a relational database (14)." Furthermore, Examiner has not particularly pointed out a citation in Cheng that contains a "metadata nesting table (94)" as described in claim 67.

Thus claim 67 is distinguishable from the disclosures contained in Cheng on the basis that the Applicants' invention discloses "a system (10) for generating (28) schema (22) for a relational database (14)" and includes a required element of "a metadata nesting table (94)". Cheng is limited and does not disclose either a system for generating schema for a relational

database or the required metadata nesting table, and thus claim 67 in the application is not anticipated by the disclosures of Cheng and is allowable.

Applicants respectfully submit that since claims 68-74 are proper dependent claims from claim 67 the claims are allowable for at least the same reasons as claim 67. Thus claims 67-74 are in condition for allowance.

II. SECTION 103(a) REJECTION OF CLAIMS

In the Office Action, the Examiner rejected claims 11, 18-29, and 48-60 as being unpatentable over U.S. Patent No. 6,519,597 issued to Cheng et al. (hereinafter "Cheng") in view of U.S. Patent No. 6,418,448 issued to Sarkar (hereinafter "Sarkar") under 35 U.S.C. 103(a).

Applicant respectfully traverses the rejection. The Examiner has not established a *prima facie* case of obviousness. A rejection of claims on the basis of section 103(a) requires that there must be some affirmative suggestion or motivation to combine or modify reference teachings. There is no suggestion that the teachings of Cheng and Sarkar should or even can be combined in the manner suggested by the Examiner.

The Examiner correctly points out that "Cheng does not explicitly indicate that the relationships are of one-to-one and one-to-many." With respect to the features referenced by the Examiner, the two patents teach away from each other and the Applicants' invention. A distinguishing feature of the Applicants' invention is that the primary key and foreign key could be used to *alter the table structure* where a one-to-one or one-to-many relationship is identified between a pair of tables, Paragraph [0049]. In Sarkar, the primary and foreign keys are *used by* XML/RDF documents to *query* to distributed relational databases (Sarkar, col 6, lines 60-65). At most, Sarkar relates to XML/RDF documents with embedded SQL methods capable of *querying* relational databases. This query occurs *after* Applicants' invention has created the tables for the relational database using the one-to-one or one-to-many relationships. Further, because the

invention in Sarkar *queries existing relational databases and does not create or modify the tables* in the relational database, there is no suggestion that the teachings of Sarkar should be applied to creating or modifying the relational database tables as in Applicants' invention. The mere fact that the invention in Sarkar makes queries to a relational database does not suggest or motivate a combination of the cited prior art to apply to the *creation* of the schema, from a document, for loading a relational database.

As correctly identified by the Examiner, Cheng does not indicate or teach the concept of one-to-one or one-to-many relationships. In fact, the structures referenced in Cheng teach away from the concept of relating tables with primary and foreign keys. Cheng references a "DTD reference table" and does not discuss relating reference tables with primary keys or foreign keys for a relational database (Cheng col. 13, lines 47-51; col. 11 Lines 58-67). Further, Cheng teaches away from applicants' invention in that the structures indicated in Fig. 10, such as a hash table or B+ tree, are used to *organize* the different attributes of an XML document in a table (Cheng col. 15, lines 1-5) and are not used for relating multiple relational database tables with a foreign key. In addition, the structures indicated in Fig. 10 are generally used for efficiently searching the XML document content, and not for relating tables in a one-to-one or one-to-many relationship (Cheng col. 15, lines 6-11).

In summary, a suggestion or motivation to combine prior art is needed for the Examiner to establish a prima facie case of obviousness, and the Examiner has not identified any such suggestion or motivation. Furthermore, differences in the underlying configuration of Sarkar (querying a database using a primary and foreign key rather than *generating the tables for storage in a relational database*) make it inappropriate to be combined with Cheng in asserting that the Applicants' invention is obvious. The fact that Cheng does not teach or suggest relating tables in a one-to-one or one-to-many configuration and Sarkar is not applicable to generation of the relational database tables suggests that Applicants' invention is not obvious. Thus claim 11 is in a condition for allowance.

Moreover, Applicant respectfully submits that Examiner's argument for rejecting claims 18-19 is precisely the same as the argument for rejecting claim 11. Because of the commonality of the rejection, the above argument used for traversing the rejection of claim 11 also applies to claims 18-19. Therefore, claims 18-19 are allowable for at least the same reasons as claim 11.

Claims 20-29 depend from claim 19. Therefore, claims 20-29 are allowable for at least the same reasons described for claim 19.

As the Examiner notes, claims 48-54 include similar material claim elements as those discussed above except that claims 48-54 are directed to a system rather than a method. Therefore, claims 48-54 are allowable for at least the same reasons described for claims 18-24.

Claim 55 depends from claim 54. Therefore, claim 55 is allowable for at least the same reasons described for claim 54.

As the Examiner notes, claims 56-60 include similar material claim elements as claims 25-29 respectively, except that claims 56-60 are directed to a system rather than a method. Therefore, claims 56-60 are allowable for at least the same reasons described for claims 25-29.

In summary, the above argument traverses the Examiner's rejection and thus claims 11, 18-29, and 48-60 are in a condition for allowance.

CONCLUSION

Claims 1-74 are in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 07-2339. If an extension of time under 37 C.F.R. § 1.136 not accounted for above is required, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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